Great Smoky Mountains National Park photographs of *Pinus pungens - Pinus rigida (Quercus prinus) / Kalmia latifolia - Vaccinium pallidum Woodland*

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COMMON NAME	Table Mountain Pine - Pitch Pine (Rock Chestnut Oak) / Mountain Laurel - Hillside Blueberry Woodland
SYNONYM	Blue Ridge Table Mountain Pine - Pitch Pine Woodland (Typic Type)
PHYSIOGNOMIC CLASS	Woodland (II)
PHYSIOGNOMIC SUBCLASS	Evergreen woodland (II.A)
PHYSIOGNOMIC GROUP	Temperate or subpolar needle-leaved evergreen woodland (II.A.4)
PHYSIOGNOMIC SUBGROUP	Natural/Semi-natural (II.A.4.N)
FORMATION	Rounded-crowned temperate or subpolar needle-leaved evergreen woodland (II.A.4.N.a)
ALLIANCE	*Pinus pungens - (Pinus rigida)* Woodland Alliance
CLASSIFICATION CONFIDENCE LEVEL	1
USFWS WETLAND SYSTEM	Upland

RANGE

Globally

This community is known from the mountains of North Carolina, South Carolina, Tennessee, and Virginia.

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This community was sampled on both the Cades Cove and Mount Le Conte quadrangles and occurs in other areas of the Park. On the Cade Cove quadrangle it was found at elevations from 2300 to 3800 feet. Areas sampled include Cobb Butt and Cobb Ridge, on south slopes and along the southern ridgeline from 3500 to 3800 feet elevation; an area north of the Cades Cove Loop Road, north of Tater Ridge, on a southwest sideridge of Cave Ridge at 2840 feet; and just southeast of the Cades Cove Loop Road, on northwest, steep, middle slopes above Anthony Creek at 2400 feet. Historic samples that may represent this community on the Cades Cove quadrangle were taken from the broad ridges and upper, west- to southeast-facing slopes north of Parsons Branch Road, above Rabbit Creek (2460 to2500 feet elevation); the upper east slopes of Leadbetter Ridge (2300 feet elevation); the eastern, middle slopes of Gregory Ridge (3040 to 3440 feet elevation); and the middle and upper south slopes of Mollies Ridge / Butt from 2840 to 3500 feet elevation. This community seems to be less common on the Mount Le Conte quadrangle and was found at elevations from 1850 to 4200 feet. It was sampled in the southwestern portion of the quadrangle, on the southeast slopes of Bullhead (4200 feet); in the central portion of the quadrangle on the lower western slopes of Mt. Winnesoka above Roaring Fork (2700 feet); north of Brushy Mountain, on the southeast slopes below Turkey Ridge (3700 feet); on the southern part of Potato Ridge; and on a northeast-running sideridge of Mt. Winnesoka, above Injun Creek (2180 feet). In the northeastern portion of the quadrangle, this community was found north of Copeland Creek, on the southwest high slopes over Copeland Creek (1850 feet).

ENVIRONMENTAL DESCRIPTION

Globally

This woodland occurs across a wide elevation range (1600-4000 feet) in the southern Appalachians, on exposed ridges and upper slopes with southerly and westerly exposures, over thin, excessively drained, nutrient-poor soils, and can be associated with rock outcroppings. Fire contributes to the maintenance of this community by destroying the litter layer, opening the canopy, releasing seed from the serotinous cones, and killing competing vegetation. Remaining examples of these forests are frequently fire-suppressed or affected by Southern pine beetle (*Dendroctonus frontalis*) and will have standing dead trees, thick litter layers, and much understory encroachment by hardwood species. Red Squirrels are known to cut branches to remove the *Pinus pungens* cones. It is thought this "squirrel grazing" may decrease the growth and vigor of trees (Zobel 1969). Canopy removal by ice storms stimulate oak sprouting and release advanced regeneration (Williams and Johnson 1992).

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This community is found on the Cades Cove quadrangle at elevations from 2300 to 3800 feet, on exposed ridgetops and on middle to upper slopes with west to southeast aspects. On the Mount Le Conte quadrangle it is found on similar sites, with south and southwest aspects, but reaches elevations over 4000 feet and as low as 1850 feet. Landforms are steep, flat to convex slopes and ridges. Soils are thin, rocky or sandy, and litter layers are thick. Almost all stands sampled showed evidence of Southern pine beetle (*Dendroctonus frontalis*) with dead or dying *Pinus pungens*.

MOST ABUNDANT SPECIES

Globally

Stratum	Species
Tree canopy	(*Pinus pungens, Pinus rigida)*
Subcanopy	*Quercus prinus, Acer rubrum, Nyssa sylvatica, Oxydendrum arboreum*
Tall shrub	*Kalmia latifolia*
Short shrub	*Vaccinium pallidum*
Herbaceous	*Galax urceolata*

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Subcanopy	*Acer rubrum, Nyssa sylvatica*
Tall shrub	*Kalmia latifolia*
Short shrub	*Gaylussacia ursina, Vaccinium pallidum*
Herbaceous	*Galax urceolata, Epigaea repens, Gaultheria procumbens*
Vine/Liana	*Smilax rotundifolia*

CHARACTERISTIC SPECIES

Globally

Pinus pungens, Fothergilla major, *Comptonia peregrina, Leiophyllum buxifolium, Gaultheria procumbens, Epigaea repens, Galax urceolata, Xerophyllum asphodeloides*

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Pinus pungens, Pinus rigida, Kalmia latifolia, Gaylussacia ursina, Gaultheria procumbens, Galax urceolata, Epigaea repens, Melampyrum lineare, Pteridium aquilinum

VEGETATION DESCRIPTION

Globally

Mostly evergreen woodlands dominated by *Pinus pungens* and/or *Pinus rigida*, occurring over a dense ericaceous shrub stratum, on sharp ridges, mostly above 2000 feet elevation in the southern Blue Ridge. Canopy coverage can often approach that of a forest, especially in areas where fire has been excluded and deciduous species have significant coverage. Deciduous species that can be important, particularly in the subcanopy, include *Quercus prinus, Quercus coccinea, Quercus stellata, Nyssa sylvatica, Acer rubrum,* and *Oxydendrum arboreum. Pinus virginiana* and *Pinus strobus* can have high coverage and even codominate on some sites. The shrub stratum is dominated by ericaceous species, typically *Kalmia latifolia* in the tall-shrub stratum and *Vaccinium pallidum* as a low shrub. Other shrub species vary with location but include *Vaccinium stamineum, Vaccinium simulatum, Vaccinium pallidum, Vaccinium hirsutum, Vaccinium corymbosum, Rhododendron minus, Leucothoe recurva, Gaylussacia ursina, Gaylussacia baccata,* and *Fothergilla major.* Species commonly found in the sparse herb stratum include *Chimaphila maculata, Galax urceolata, Pteridium aquilinum* var. *latusculum, Xerophyllum asphodeloides, Comptonia peregrina, Leiophyllum buxifolium, Gaultheria procumbens, Iris verna, Dichanthelium* spp., and *Epigaea repens*, although herbaceous species composition will vary within the range of this community. *Smilax glauca* is a common vine.

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This community has a woodland to forest canopy dominated by *Pinus pungens* and/or *Pinus rigida*, which often overtop all other trees species. The canopy can include many standing dead and dying *Pinus* species. Some occurrences may have significant canopy coverage by *Quercus prinus* or *Quercus coccinea*. A tree subcanopy may be absent or well-developed, with as much as 80 percent coverage and composed of small-diameter trees, typically *Acer rubrum, Oxydendrum arboreum*, and *Nyssa sylvatica*. Other tree species that can occur in the canopy and subcanopy include *Amelanchier laevis, Castanea dentata, Magnolia fraseri, Pinus virginiana, Quercus rubra, Robinia pseudoacacia, Carya alba, Pinus strobus*, and *Tsuga canadensis*. A tall-shrub stratum varies from sparse and patchy to dense and continuous, often dominated by *Kalmia latifolia* and/or *Vaccinium stamineum*. Occurrences at high elevations (over 4000 feet) have *Pieris floribunda* as a dominant shrub. The short shrub stratum ranges in coverage from 0 to 80 percent and is often dominated by *Gaylussacia ursina*. Other shrubs that may dominate this stratum include *Vaccinium hirsutum, Vaccinium pallidum*, and *Gaylussacia baccata*. Additional shrub species that are found in this community include species from the canopy and subcanopy, as well as *Acer pensylvanicum, Ilex montana, Pyrularia pubera, Quercus velutina, Rhododendron carolinianum, Rhododendron calendulaceum, Rhododendron maximum,* and *Sassafras albidum*. The herbaceous stratum can be sparse to moderate in coverage and is composed of various sub-shrubs and dry site forbs. *Epigaea repens, Galax urceolata,* and *Gaultheria procumbens* typically have the most coverage. Other species in the herbaceous stratum can include *Chimaphila maculata,Cleistes divaricata, Coreopsis major, Cypripedium acaule, Dichanthelium commutatum, Goodyera pubescens, Melampyrum lineare, Pteridium aquilinum, Schizachyrium scoparium,* and *Tephrosia virginiana.* The litter layer is thick and often makes up greater than 50 percent of the ground cover. *Smilax rotundifolia* is a common vine.

OTHER NOTEWORTHY SPECIES
Species in this community, which have the bulk of their worldwide range in the southern Blue Ridge, include *Leiophyllum buxifolium, Pieris floribunda, Pinus pungens*, and *Xerophyllum asphodeloides*. Animals found in this community include Red Squirrel *(Tamiasciurus hudsonicus*) and Wild Turkey *(Meleagris gallopavo*). The Mountain Pine Coneworm (*Dioryctria yatesi*), a moth larva that feeds only on the cones of *Pinus pungens,* may be locally abundant in this community (Hedlin *et al.* 1981).

CONSERVATION RANK G3

RANK JUSTIFICATION
This community is endemic to the southern Appalachian Mountains where it is maintained by periodic fire or extreme site conditions. Recent studies show that acreage of this community has decreased due to fire suppression (Turrill and Buckner 1995) and that many remaining examples have substantial hardwood invasion.

DATABASE CODE CEGL007097

COMMENTS
Globally
Without periodic fire, this community will gradually succeed into forests dominated by *Quercus prinus* and *Quercus coccinea* (CEGL006271), except on the most extreme sites, where this vegetation is self-perpetuating. It is thought that woodlands dominated by *Pinus pungens* are associated with more xeric conditions than woodlands dominated by *Pinus pungens* in combination with other tree species (Barden 1977, Zobel 1969). Other communities with *Pinus pungens* occur in central Pennsylvania and in Virginia. These northern types are thought to have a different species composition and geology than the forests described here. Species associated with *Pinus pungens* in the northern part of its range that do not occur in this community include *Quercus ilicifolia, Viburnum acerifolium,* and *Vaccinium angustifolium*.

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Examples at the lowest elevations (below 2300 feet) on the Mount Le Conte quadrangle lacked *Pinus pungens* and *Pinus virginiana* and were dominated by *Pinus rigida* and *Quercus coccinea*. Many former examples of this community now exist as chestnut oak forests (CEGL006271) due to fire suppression and pine mortality due to Pine Bark Beetle. This community often grades into *Quercus prinus*-dominated forests (CEGL006271) on the ridgelines above. Other adjacent communities can include heath shrublands or oak - hickory forests on less exposed sites.

REFERENCES
Barden 1977, Golden 1981, Hedlin et al. 1981, McLeod 1988, Nelson 1986, Newell and Peet 1995, Racine 1966, Schafale and Weakley 1990, Turrill and Buckner 1995, Wharton 1978, Whittaker 1956, Williams 1991, Williams and Johnson 1990, Williams and Johnson 1992, Williams et al. 1990, Zobel 1969